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Gifted students' perceptions about intelligence: A metaphor study[1]

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Abstract. The purpose of this study is to investigate gifted students' perceptions about intelligence. The study was conducted with a total of 103 students, 38 females and 65 males, attending a science and art center in Ankara. The data were collected through metaphors from the gifted students. The students were given a form prepared by the researchers, and they were asked to complete the form including the expression "Intelligence is like……. because……..". As a result of the study, 68 valid metaphors related to the concept of intelligence were obtained. The metaphors produced were grouped under eight conceptual themes: "Changeable and Incremental, Tool functioning, Can be used for good or evil, Valuable, Associated with strong memory, Can be different from person to person, Unlimited, To be discovered" in terms of their common characteristics. As a result of the study, it is concluded that gifted students perceive intelligence at most as "money" and "galaxy" and generally have the perception of incremental intelligence.

Keywords: Intelligence, gifted student, metaphor

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INTRODUCTION

When the literature is reviewed, it is observed that experts have not reached a consensus on the definition of intelligence yet (Çuhadar, 2017). Intelligence is a capacity according to psychologists and a talent according to educators (Çiltaş, Demirci, and Güler, 2018). Whereas Gardner (1989) considers intelligence as the capacity to solve problems or bring together the products valued in different cultural environments, Stenberg (1985) regards intelligence as a developable mental activity or process (As cited by Sabatella, 1999). According to Clark (2015), definitions of intelligence mostly focus on behavior and performance. Different views on the definitions of intelligence also appear in the classifications related to intelligence. Stenberg classified the types of intelligence according to what metaphors (geography, mathematics, biology, genetics-epistemology, anthropology, sociology, and system thought) people perceived intelligence with, and Gardner classified them in respect to the dominant views (psychometric, developmental, biological, cognitive, and new perspective) (Bacanlı, 2008). In addition to the definitions and classifications related to intelligence, some researchers concentrated on the elements related to intelligence and talent. In a study conducted for this purpose, Snyderman and Rothman (1987) benefited from the opinions of psychologists and educators and thus, determined that participants focused on some elements related to intelligence and talent. Among these elements related to intelligence, (a) abstract thinking or causality, (b) the capacity to have information, and (c) problem-solving skill are in the first three places.

No single and universal definitions of intelligence have been put forward as a result of scientific studies on intelligence, which can be said to result from the dynamic characteristic of intelligence. Intelligence is a concept that can be defined in different ways, at different times, in different cultures and societies. Therefore, it is necessary to pay attention to the lives and experiences of individuals constituting a society and judgments in their minds while defining intelligence. These judgments do not come out of individuals' minds if they are not revealed as a result of stimulation (Demirel, 2008). For this reason, some studies focused on opinions

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(Beyaztaş and Dawson, 2017; Rindermann, Becker and Coyle, 2016), perceptions (Anderson, 2009; Becker, 2012; Beyaztaş and Hymer, 2018), and beliefs (Brougham ve West, 2018; Campbell, 2000; Jones, Rakes and Landon, 2013; Devers, 2015; Stump, Husman, Chung and Done, 2009; Ziegler, Schober and Dreser, 2005) of experts, families, and students, who were not identified as gifted, on intelligence. While individuals, who constituted the sample, were observed to believe that intelligence could be improved in some studies (e.g., Jones et al., 2013) in some other studies, they were observed to perceive intelligence as fixed (e.g., Beyaztaş and Hymer, 2018). In addition to the studies conducted with participants such as experts, educators, and parents, there are also various studies that examine the opinions, perceptions, and beliefs of gifted individuals, who are the most associated group with intelligence, on intelligence (Alexander, 1985; Makel, Snyder, Thomas, Malone and Putallaz, 2015; Porath, 1997; Snyder, Barger, Wormington, Bloom and Garcia, 2013; vanBemmel, 2014). In one of these studies, vanBemmel (2014) examined beliefs of a total of 246 students, who were aged between 10-16 years and who were gifted or were not identified as gifted, about intelligence.

The Implicit Theories of Intelligence Scale developed by Dweck and Henderson (1989) was applied to students in order to collect data. As a result of the study, it was concluded that the rate of viewing intelligence as fixed was higher in gifted students in comparison with their peers, not identified as gifted. In the study conducted by Makel et al. (2015), 365 gifted students attending fifth and sixth grades were examined for their beliefs about intelligence and giftedness. In the study, in which the Implicit Theories of Intelligence Scale developed by Dweck and Henderson (1989) was used to collect data, data related to giftedness were also collected by using the word "giftedness" instead of the word "intelligence" in the scale items. As a result of the study, it was concluded that gifted students had different beliefs about intelligence and giftedness, perceived the nature of intelligence and giftedness differently, and viewed intelligence as incremental while giftedness as fixed. In these studies, using the Implicit Theories of Intelligence Scale, in the context of certain items included in the scale, the beliefs of gifted students about intelligence were determined by focusing on whether intelligence was fixed or incremental. In the study conducted by Alexander (1985), perceptions of students, who were gifted and were not identified as gifted, about the concept of intelligence were determined by using semi-structured interview forms, and it was concluded that students, who were both gifted and were not identified as gifted, regarded intelligence as a feature that could be developed with hard work and positive attitude. In another study in which data were collected through interviews, Porath (1997) examined the development of gifted students' perceptions about intelligence with age. Thirty-three gifted students aged 6-12 participated in the study. The study, in which data were collected through semi-structured interviews, concluded that gifted students' perceptions about intelligence became more complex with age.

In a study conducted with 1743 first-year university students enrolled at a university, which accepts high-level students in the USA, Snyder et al. (2013) investigated whether there was a significant correlation between students' time of being identified as gifted, giftedness, academic giftedness, and implicit beliefs about intelligence, by using an online survey. As a result of the study, it was concluded that academic giftedness was the only significant predictor in students identified as gifted and that the belief of viewing intelligence as fixed was higher in gifted students who had higher academic performance than their lower-performing peers. Based on the results obtained from the mentioned studies, it is observed that the beliefs and perceptions of gifted students about intelligence focus on two points: (a) Intelligence is a fixed feature, (b) Intelligence is a feature that can be developed through work and education. These studies are important for gifted students to gain awareness of intelligence and recognize themselves from this point of view. Dweck (2016) stated that beliefs about intelligence were important in terms of directly affecting gifted students' motivation, academic performance, and perspectives on the education provided to them. Furthermore, there are opinions in the literature stating that knowing what intelligence means for gifted students can help in preparing curricula for these students (Porath, 1997) and in determining the road map about how these students will be motivated in academic sense or their self-reliance will be supported (Stipek and

Maclver, 1989). There are also opinions that beliefs about intelligence may be effective in predicting outcomes for success (Stipek and Gralinski, 1996).

In the mentioned studies which were conducted in order to determine the perceptions, beliefs, and opinions of gifted students about intelligence, data were collected through interviews, questionnaires, and scales. Another way to determine the perceptions, beliefs, and opinions of gifted students about intelligence is to collect data through metaphors. Metaphors are "conceptual responses, which enable determining individuals' perceptions and attitudes with regard to any concrete or abstract phenomenon, situation and/or process and which take place in their minds regarding these elements" (Koç, 2014, p. 52). Metaphors, which can often be substituted for rhetorical arts such as analogy, comparison, istiare, and metaphor, can be included in the analogy types as a rhetorical art according to Quine (2003). However, unlike the analogy, they leave a broader area to the richness of the mental comprehension of the producer and listener (cited by Ertürk, 2017). Metaphors take us beyond the details, truths, and moments of daily experiences as a source for establishing communication (Weade and Ernest, 1990). According to Ocak and Gündüz (2008), metaphors can be used as a powerful tool in explaining complex phenomena and revealing students' perceptions and learning styles. In recent years, metaphors have become a tool used by many researchers in the process of finding answers to various problems (Koç, 2014), and the study results have shown that gifted students' perceptions of different topics can be revealed in a rich way through metaphors (Aslan and Doğan, 2016; Çifçi, 2015; Erişen, Şahin, Birben and Yalın, 2016; Karabulut, Mertol and Alkan, 2017; Mertol, Doğdu and Yılar, 2013; Özsoy, 2014; Öztürk, Akkan and Kaplan, 2014; Satmaz, Tortop and Temiz, 2018; Esentürk, Demir and İlhan, 2017). When the mentioned studies were reviewed, it was observed that the perceptions of gifted students about some courses (Çifçi, 2015; Mertol et al., 2013; Yılmaz et al., 2017), the Science and Art Center (BİLSEM) and the schools where they received education (Aslan and Doğan, 2016; Erişen et al., 2016; Satmaz et al., 2018), the media (Karabulut et al., 2017), the concept of mathematics (Öztürk et al., 2014), and giftedness (Özsoy, 2014) were examined. However, in the literature, any study examining the perceptions of gifted students about intelligence through metaphors was not found.

As a result, the literature review showed that (a) there were studies which investigated the perceptions, opinions, and beliefs of experts, parents, and students who were not identified as gifted about intelligence; (b) there was a limited number of studies that collected data through scales, questionnaires, and interviews to determine the perceptions, opinions, and beliefs of gifted students about intelligence; (c) there were studies, which investigated gifted students' perceptions of different topics through metaphors, and content-rich data could be collected from gifted students through metaphors. Based on these points, this study aimed to determine the perceptions of gifted students about the concept of intelligence through metaphors.

METHODS

This study was designed with phenomenology design, which is one of the qualitative research designs. "Phenomenology design focuses on cases which we are aware of, but of which we do not have an in-depth and detailed understanding" (Yıldırım & Şimşek, 2016, p. 69). Individual experiences form the basis of phenomenology. For this reason, in studies conducted with phenomenological design, the researcher focuses on the individual experiences of the participant and the meanings he/she attributes to events (Baş and Akturan, 2017).

In the study, the data were analyzed by collecting them through metaphors. As a result of the analysis, the perceptions of gifted students about intelligence were tried to be described. According to Morgan (1986), "Metaphors are used to describe a situation or improve a process" (Cited by Yıldırım and Şimşek, 2016, p. 210). Through metaphors, personal and detailed information can be accessed, and by using its systematic reflections, information that can be discussed and then put into action can be obtained (Güneş and Fırat, 2016). Since this study aimed to determine the perceptions of students, who had an intelligence level above normal and were identified as gifted, about intelligence by taking their experiences as a basis, it was

designed with phenomenology design; and since it was focused generally on how the students perceived and comprehended intelligence, the data were collected through metaphors.

Participants

The participants of the study consisted of 103 gifted students at the secondary school level attending a BİLSEM in Ankara in the 2017-2018 academic year. Of the 103 students participating in the study, 31 (30.1%) were 5th-grade students, 44 (42.7%) were 6th-grade students, 20 (19.4%) were 7th-grade students, and 8 (7.8%) were 8th-grade students. Moreover, 38 (37%) of the students were female, and 65 (63%) were male. The easily accessible sampling method was used to determine the participants. The sample consisted of secondary school students since the number of high school students attending the BİLSEM where the study was conducted was low and since it was assumed that primary school students might have difficulty in producing metaphors due to their limited abstract thinking skills.

Data Collection

The data of the study were collected through a form prepared by the researchers. During the preparation of the form, expert opinion was received from an instructor working at the Department of Turkish Language Education and from a BİLSEM philosophy teacher who carried out studies on metaphors and analogies. The first section of the form included a brief description of the study and questions for determining the gender of the participants and their grade level. The second section of the form included an open-ended question: "Intelligence is like..... because.....". While the concept of "like" in the question explains the link between the source and the subject in the metaphor, the concept of "because" allows students to present the logical basis of metaphors they create (Saban, 2008). Prior to the data collection in the study, the researcher who worked as a Turkish teacher in the BİLSEM explained to the students what metaphors are and gave metaphor examples on different subjects, and the students were then asked to fill in the form.

Data Analysis

The listed steps were followed in the analysis of the metaphors produced by the participants. In the first stage, the metaphors produced by gifted students were coded and listed alphabetically. In this stage, the forms distributed to the students to produce metaphors were examined by the researchers, and in this examination, five forms in which no metaphors were produced or in which metaphors were produced, but the reason was not explained, were eliminated (e.g., "Intelligence is very intelligent; intelligence is like a gap because..."). Afterward, each metaphor was analyzed in terms of the source and subject of the metaphor, and the relationship between the source and the subject (Forceville, 2002). For example, in the metaphor "Intelligence is like a muscle because it develops as you use it," the subject of the metaphor was evaluated as "intelligence," and the source was evaluated as "muscle." In the mentioned metaphor, the relationship which was tried to be established between the subject and the source was evaluated as the development of the muscle with its use. In this process, the researchers independently examined whether the alphabetically listed metaphors had metaphorical characteristics, and by considering the relationship between the source and the subject, they eliminated 30 forms in which any reasonable justification was not presented for the metaphor, by reaching a 100% consensus (e.g., "Intelligence is like life because life is beautiful.", "Intelligence is like a walnut because I like walnuts."). After the elimination, 68 forms remained. An alphabetical list was created again for the metaphors in the remaining forms. This stage was followed by the theme forming process. The researchers produced themes, independently of each other, based on the obtained valid metaphors' common features and the literature, and they listed the metaphors under these themes. The process of producing themes and listing the metaphors under these themes continued until 100% consensus was reached, and as a result, 68 metaphors were listed under the eight themes created. Afterward, concerning the final list, the opinion of an expert, who worked as an instructor in the field of Turkish Language and

Literature and had research experience about the use of metaphors, was received. The expert was asked to list the 68 metaphors under the determined themes, independently of the researchers. Whether the list formed by the researchers and the list formed by the expert overlapped with each other was evaluated using the formula "consensus / (consensus + dissensus) x 100" (Miles and Huberman, 1994). The list created by the researchers was observed to overlap with the list created by the expert at an average level of 89.65% (Range = 80-100%). Analyses continued until 100% consensus was reached between the researchers and the expert. The internal reliability of the study was tried to be ensured through studies conducted at different stages of the research, which intended to determine and increase consistency between the researchers and the expert. The credibility of the study was tried to be increased by explaining the data analysis process in detail and by giving direct quotations related to the metaphors of the students in the writing and interpretation of the results. In the final stage, frequency and percentage calculations were made.

RESULTS

The gifted students produced 68 valid metaphors related to intelligence. These metaphors were examined under eight conceptual themes. These conceptual themes were as follows: "Changeable and Incremental, Tool functioning, Can be used for good or evil, Valuable, Associated with strong memory, Can be different from person to person, Unlimited, and To be discovered." The same metaphors produced by the students were evaluated under different themes due to the relationship between the source and the subject of the metaphor. For example, two of the five metaphors, which likened intelligence to the galaxy, were included in the theme of "Changeable and Incremental," one in the theme of "To be discovered," one in the theme of "Unlimited," and one in the theme of "Valuable." Two of the money metaphors, one of the most produced metaphors by the students, were included in the theme of "Changeable and Incremental," one in the theme of "Can be used for good or evil," one in the theme of "Can be different from person to person," and one in the theme of "Valuable." Metaphors that likened intelligence to water, space, smartphone, and the world were also included in different themes based on the relationship between the source and the subject. In this section, the data on 68 metaphors collected from the students and the distribution of these metaphors according to conceptual themes were given, and these data were presented in Table 1.

Table 1. *Distribution of metaphors related to the concept of ıntelligence according to conceptual themes*

Conceptual Themes	Frequency	Percentage	Related Metaphors
Changeable and Incremental	23	33.82	Perfume, Tree (2), Galaxy (2), World, Bee, Money (2), Field, Expanding Bag, Muscle, Life, New Car Engine, Plant, Flower, Space, Broken Bulb, Weather, Student (2), Woman, Universe
Tool functioning	11	16.18	Compass (3), Shield, Key, Software, Smartphone, First Aid Kit, Bag, Fire Extinguisher, Swiss Army Knife
Can be used for good or evil	8	11.77	Smartphone, Beam Sword, Dog, Knife (2), Money, Antibiotic, Paint Brush
Valuable	7	10.30	Money, Galaxy, Gold, Element, Air, Water (2)
Associated with strong memory	6	8.82	Cupboard, Computer, Box, Strong Memory that is not filled, Diary, Someone who is hungry
Can be different from person to person	5	7.35	Water, Gemstone, Bucket, Money, Music
Unlimited	5	7.35	Galaxy, Line, Dream, Imagination, Space
To be discovered	3	4.41	Galaxy, Earth, Planet
Total	68	100	

The most produced metaphors by the gifted students were the galaxy (f = 5) and money (f = 5). When Table 1 was examined, it was observed that the gifted students likened intelligence

mostly to tangible entities (f = 63; 93%) and perceived it mostly as "Changeable and Incremental" (f = 23; 33.82%). The metaphors produced by the gifted students with regard to the concept of intelligence and the conceptual themes created were presented under the following headings by directly quoting the participants.

1. Those who Perceive Intelligence as a Changeable and Incremental Concept

In this theme, metaphors emphasizing that intelligence could change and develop through education, hard work, and effort over time were discussed. This theme is the theme in which the students produced the highest number of metaphors about intelligence. There are 23 metaphors under this theme. The most repeated metaphors in this theme were a tree, galaxy, student, and money. The following statements may be given as examples of the metaphors produced by the students who perceived intelligence as a changeable and incremental concept: *"Intelligence is like a field because the more you deal with it, the more yield you get (S.35).", "Intelligence is like a muscle because it develops as you use it (S.40)"*.

2. Those who Perceive Intelligence as a Tool Functioning Concept

Metaphors emphasizing intelligence as a means of doing a job, achieving a goal or success were discussed in this theme. This is the second theme in which the highest number of metaphors was listed. There are 11 metaphors under this theme. In this theme, the compass was the most repeated metaphor. The statements such as *"Intelligence is like a shield because it allows us to defend ourselves when its time comes (S.4).", "Intelligence is like a Swiss army knife because it is good for each work (S.59)."* could be given as examples of the metaphors produced under this theme.

3. Those who Perceive Intelligence as a Concept That Can Be Used for Good or Evil

Metaphors included in this theme emphasize that intelligence can be used sometimes for good and sometimes for evil and that it enables us to reach success when it is used for good, and it causes negative results when it is used for evil. Eight metaphors were produced under this theme, and the most produced metaphor was the knife. The statements such as *"Intelligence is like an antibiotic because it cures illnesses if it is used well, and it causes pain if it is used in vain (S.56).", "Intelligence is like a beam sword because, in the hands of the rookie, it can kill him, but it creates wonders in the hands of the Jedi (S.11)."* could be given as examples.

4. Those who Perceive Intelligence as a Valuable Concept

Metaphors, emphasizing that intelligence is a very valuable feature, were discussed under this theme. Seven metaphors were produced in this theme. The statements such as *"Intelligence is like money because it is very valuable (S.19).", "Intelligence is like gold because it is very valuable (S.70)."* can be given as examples of the metaphors produced under this theme.

5. Those who Perceive Intelligence as a Concept That is Associated with Strong Memory

Under this theme, metaphors emphasizing that intelligence is associated with having a strong memory were discussed. Six metaphors were produced under this theme. None of the metaphors was produced more than once in the theme of intelligence associated with strong memory. *"Intelligence is like a cupboard because we store knowledge in it (S.18).", "Intelligence is like a computer because the computer stores everything in it (S.22)."* are the statements that could be given as examples of the metaphors produced under this theme.

6. Those who Perceive Intelligence as a Concept That Can Be Different from Person to Person

In this theme, metaphors emphasizing that the level of intelligence may vary from person to person were discussed. Five metaphors were produced under this theme, and no metaphor was produced more than once. *"Intelligence is like water because it is an ocean in some people and a drop in the others (S.8).", "Intelligence is like a bucket because it is sometimes empty,*

sometimes full (S.24)" are the statements could be given as examples of the metaphors produced under this theme.

7. Those who Perceive Intelligence as an Unlimited Concept

Metaphors emphasizing that intelligence is unlimited and endless were examined in this theme. Five metaphors were produced under this theme. The metaphors produced under this theme were determined to be the galaxy, line, dream, imagination, and space. *"Intelligence is like the galaxy because it is endless (S.27).", "Intelligence is like a line because it has no limit (S.43)."* are the statements could be given as examples of the metaphors produced under this theme.

8. Those who Perceive Intelligence as a Concept That Is to Be Discovered

Three metaphors, which emphasized the need for revealing, discovering, and processing intelligence, were produced under this theme. *"Intelligence is like the galaxy because it has many things to discover (S.2).", "Intelligence is like a planet because the more we discover every place of it, the better we can evaluate it. (S.63)."* are the statements showing that the students see intelligence as an element of curiosity and perceive intelligence as a feature to be discovered.

DISCUSSION and CONCLUSIONS

This study aimed to determine the perceptions of gifted students about the concept of intelligence through metaphors. The data were collected from 103 gifted students about the concept of intelligence, and as a result of the study, 68 valid metaphors were observed to be produced. The metaphors produced were grouped under eight conceptual themes. These themes were determined to be as follows: "changeable and incremental, tool functioning, can be used for good or evil, valuable, associated with strong memory, can be different from person to person, unlimited, and to be discovered." As a result of the study, 68 valid metaphors could be collected from 103 gifted students. The reason for such a low number of metaphors is the grade level of the participating students. The subject of metaphors is dealt with as “analogy (comparison)” under the title of rhetorical arts in the Turkish language program at the secondary school level [Ministry of National Education (MNE), 2018]. In the teaching of the subject, it is observed that studies are mostly conducted on an existing text or that how to solve questions about analogy is explained in multiple-choice tests. However, metaphors are used to symbolize our mental and intellectual understanding system rather than artistic functions such as analogy (Saban, 2008). Therefore, the subject of metaphors is dealt with in detail in either elective thinking skills courses or philosophy group courses at the high school level. This situation might have caused the students to be inadequate and to experience difficulty while producing metaphors and using them in their daily lives. When the metaphors produced by the gifted students were examined, it was observed that the students mostly likened intelligence to tangible entities (f = 63). This situation is also observed in the literature in other studies conducted with gifted students by using metaphors (Aslan and Doğan, 2016; Çifçi, 2015; Erişen et al., 2016; Karabulut et al., 2017; Mertol et al., 2013; Özsoy, 2014; Öztürk et al., 2014; Satmaz et al., 2018; Yılmaz et al., 2017). For example, in the study in which Aslan and Doğan (2016) focused on the metaphoric perceptions of gifted students about the schools and BİLSEM they attended, gifted students were observed to liken the schools they attended to tangible entities in 43 of the 47 metaphors and BİLSEM to tangible entities in 42 of the 47 metaphors. According to Pipen (2001), the use of metaphors is like an interpretive tool and allows the understanding of a complicated situation. Furthermore, metaphors can be evaluated as concrete expressions of harmony and order (Cited by Cerit, 2008). Therefore, students' effort to define an abstract concept such as intelligence by concrete concepts is an expected situation.

According to the themes created from the collected metaphors, the gifted students were observed to perceive intelligence at most as a changeable and incremental concept (f = 23). Many studies conducted to determine beliefs and perceptions about intelligence have focused on whether intelligence is fixed or incremental. Although this study did not focus directly on this point, from the metaphors they produced, the students were observed to perceive intelligence

as incremental. This result overlaps with the results of the study conducted by Makel et al. (2015), in which they investigated the implicit beliefs of gifted students about intelligence and giftedness. Makel et al. (2015) concluded that gifted students believed that intelligence was incremental. In the study conducted by Alexander (1985), it was revealed that gifted students and students who were not identified as gifted regarded intelligence as a feature that could be developed with hard work and a positive attitude. In the studies conducted with participants other than gifted students (e.g., Jones et al., 2013), results indicating that intelligence was incremental were obtained, and these results were similar to the results of this study. In the literature, besides the studies which support the study results arguing that intelligence is changeable and incremental, there are also study results that are not consistent with these findings. For example, Beyaztaş and Hymer (2018) concluded in the study, which they conducted with a total of 1350 Turkish students whose education levels varied from 4th grade to the last year of university, that students perceived intelligence as fixed. This result did not change in 582 students who formed the secondary school part of the study. The reason for these differences between the results of these studies may be that this study focused on whether intelligence was fixed or incremental, and that the sample group was composed of secondary school students who were not identified as gifted, and that the current study aimed to reveal that secondary school students, who were identified as gifted, could freely express their perceptions of intelligence with the help of metaphors. The students' perception of intelligence as a changeable and incremental feature also has a determinative effect on the students' performance in practice environments. According to Dweck (2016), students, who believe that intelligence can be developed and that learning can be realized as a result of hard work, exhibit a higher level of motivation than students who regard intelligence as fixed, are not afraid of challenges and improve their academic performance in comparison with the other group. With a similar view, Anderson (2009) created a computer application for his students for the statistics course by using the "muscle" metaphor, tried to motivate his students with the view that intelligence was incremental, and obtained positive results after the application. Devers (2015) concluded that there was a positive correlation between high school students' beliefs that intelligence was incremental, and their academic performance and development.

As a result of the study, the second theme with the highest number of metaphors was found to be the tool theme (f =11). It can be said that gifted students regard intelligence as a tool of which power is utilized with aims such as doing a job or finishing it. Intelligence is an individual's ability to succeed in life and enables the individual to achieve his/her goals within the environmental conditions (Yılmaz & Taş, 2016). Considering from this aspect, it can be said that gifted students' regarding intelligence as a tool for achieving a goal or success is a result that supports the literature.

The third theme, under which the gifted students produced the highest number of metaphors, is the theme of "can be used for good or evil" (f = 8). This situation is expressed within society and in the literature from time to time. One of the most striking examples of this belongs to Stenberg (2018). Stenberg (2018) showed "Gandhi" as an example of using intelligence for good, and "Hitler" as an example of its use for evil. The gifted students, who participated in this study, also perceive intelligence as a feature that can be used for good or evil purposes.

The fourth theme, under which the gifted students produced the highest number of metaphors, is the theme of "valuable" (f = 7). Intelligence is the most determinative feature in determining gifted students in our country and providing education and support services to them. Considering from this aspect, intelligence takes an essential place in the lives of gifted students in terms of making a distinction between them and their peers and enabling them to receive education in a different environment. Based on this situation, it can be said that students' perceiving intelligence as a valuable feature is an expected situation (MNE, 2013; MNE, 2016; Sak, 2018).

The fifth theme, under which the gifted students produced the highest number of metaphors, is the theme of "strong memory" (f = 6). According to Thurstone, memory, which is a kind of information processing mechanism that enables the storage of various information and

its recall when needed (Engin, Calapoğlu and Gürbüzoğlu, 2008), is one of the seven factors that make up intelligence (Gürel and Tat, 2010). In the literature, it is emphasized that giftedness is associated with high mental performance, and high mental performance is associated with memory (Köksal & Akkaya, 2017); the studies investigating the relationship between memory and intelligence reveal that there is a positive correlation between the short-term memory capacity and intelligence level (Ackerman, Beier and Boyle, 2005). The result obtained from the study is parallel to the literature from this aspect.

The sixth theme, under which the gifted students produced the highest number of metaphors, is the theme in which they perceived intelligence as a concept that could be different from person to person (f = 5). Gifted students may be different from their typically developing peers in terms of intelligence, as well as they may also differ from each other (Lovecky, 1992). Besides the intelligence level, developmental characteristics and academic performance also play an important role in evaluating a person as gifted (Sak, 2017). Since gifted students are aware of the characteristics that distinguish them from their peers, they may have expressed views on this theme.

The seventh theme, under which the gifted students produced the highest number of metaphors, is the theme of "unlimited" (f = 5). According to Clark (2015), the studies conducted on the brain, intelligence, and learning reveal that we do not have limits, but beliefs have a limiting effect on intelligence and giftedness. Strong imagination and libertarian belief systems of gifted students may have enabled them to perceive intelligence as unlimited.

The theme, under which the gifted students produced the least number of metaphors and which was found to be in the eighth place, is the theme of "to be discovered" (f = 3). This result shows that gifted students perceive intelligence as a concept that is intriguing and that needs to be discovered. Studies on intelligence date back to the 19th century (Demirel, 2008). Not reaching a consensus on intelligence-related issues in the studies conducted from the 19th century to date (Çuhadar, 2017) shows that intelligence is perceived not only by gifted students but also by experts as a concept that is intriguing and needs to be discovered.

As a result, it was observed that most of the gifted students, who participated in the study, had a perception that intelligence was incremental, that without any guiding, they emphasized the prominent points in the literature regarding the concept of intelligence, and that their awareness of intelligence was high. Based on this study, which is limited to 68 metaphors obtained from 103 students attending the BİLSEM and receiving education at the secondary school level, suggestions can be made for future research and increasing the quality of education and services to be provided to gifted students. Weade and Ernst (1990, p. 133) stated that metaphors presented only a part of the phenomenon they were trying to define, rather than the whole of it. Therefore, more metaphors are needed in order to explain the examined cases as a whole. For this reason, in future studies, it may be recommended to conduct research with more participants and to increase the number of metaphors, and to collect data after a comprehensive training process on metaphors in case the number of metaphors collected in the study is considered to be low. For this purpose, firstly, it can be ensured that students study the subject of metaphors with examples, that they produce metaphors related to various concepts and facts, and that they discuss these metaphors with each other in the class and analyze the metaphors. As mentioned previously, students' in-class motivation and performance can be enhanced by positive inducements on the changeability of intelligence.

REFERENCES

Ackerman, P. L., Beier, M. E., & Boyle, M. O. (2005). Working memory and intelligence: The same or different constructs? *Psychological Bulletin, 131*(1), 30-60.

Alexander, A.P. (1985). Gifted and non-gifted students' perceptions of intelligence. *Gifted Child Quarterly, 29*(3), 137-143.

Anderson, V.S. (2009). *Mental muscularity: Shaping implicit theories of intelligence via metaphor* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3391136)

Aslan, H. & Doğan, Ü. (2016). Üstün yetenekli öğrencilerin devam ettikleri okulları ile bilim

ve sanat merkezine ilişkin metaforik algıları: Karşılaştırmalı durum çalışması [Metaphoric perceptions of gifted students of schools and art and science centers they attend: A comparative case study]. *Abant İzzet Baysal Üniversitesi Eğitim Fakültesi Dergisi, 16* (2), 335-350.

Bacanlı, H. (2008, Mayıs). Zekâ kavramının gelişimi [Development of the concept of intelligence]. *Üstün Zekâlı ve Yetenekli Çocuklar Kongresi,* Ankara.

Baş, T. & Akturan, U. (2017). *Sosyal bilimlerde bilgisayar destekli nitel araştırma yöntemleri (Güncellenmiş ve Genişletilmiş 3. Baskı)* [Computer-aided qualitative research methods in social sciences (Updated and Extended 3rd Edition)]. Ankara: Seçkin Yayıncılık.

Becker, D.J. (2012). *Avid students' perceptions of intelligence: A mixed method study* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3510362)

Beyaztaş-İlhan, D. & Dawson, E. (2017). A cross national study of students' teachers' views about intelligence: Similarities and differences in England and Turkey. *Universal Journal of Educational Research, 5*(3), 510-516. doi: 10.13189/ujer.2017.050324

Beyaztaş-İlhan, D. & Hymer, B. (2018). An analysis of Turkish students' perceptions of intelligence from primary school to university. *Gifted Education International, 34*(1), 19-35. doi: 10.1177/0261429416649041

Brougham, L. & West-Kashubeck, S. (2018). Impact of a growth mindset intervention on academic performance of students at two urban high schools. *Professional School Counseling, 21*(1), 1-9. doi: 10.1177/2156759X18764934

Campbell, M.L. (2000). *The unspoken dialogue: Beliefs about intelligence, students and instruction held by a sample of teachers familiar with the theory of multiple intelligences* (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 9980445)

Cerit, Y. (2008). Öğretmen kavramı ile ilgili metaforlara ilişkin öğrenci, öğretmen ve yöneticilerin görüşleri [The opinions of students, teachers, and administrators about metaphors related to the teacher concept]. *Türk Eğitim Bilimleri Dergisi, 6*(4), 693-712.

Clark, B. (2015). Üstün zekâlı olarak büyümek [Growing up as gifted]. Ankara: Nobel yayınları. Çeviren Fatih Kaya, Üzeyir Oğurlu.

Çifçi, T. (2015). Üstün yetenekli öğrencilerin coğrafya dersine ilişkin algıları/Perceptions of the gifted students on the geography lesson. *e-International Journal of Educational Research, 6*(3), 87-100.

Çiltaş, A., Demirci, G., & Güler, G. (2018). 7. sınıf öğrencilerinin zekâ türlerine göre matematiksel modelleme problemi çözebilme becerilerinin incelenmesi [An investigation of 7th-grade students' abilities to solve mathematical modeling problems, according to their intelligence types]. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 22*(2), 889-903.

Çuhadar, C. H. (2017). Müziksel zekâ [Musical intelligence]. Ç. Ü. *Sosyal Bilimler Enstitüsü Dergisi, 26*(3), 1-12.

Demirel, Ş. (2008). *Abraham Tannenbaum'un üstün yetenek sınıflandırmasına giren örnek yetenek türlerinin toplumsal değeri üzerine bir araştırma* [A study on the social value of exemplary types of giftedness included in Abraham Tannenbaum's classification of giftedness] (Yüksek Lisans tezi). Yükseköğretim Kurulu Ulusal Tez Merkezinden edinilmiştir. (Tez No. 228455)

Devers, A. (2015). Thinking about intelligence: How students mindset influence academic performance. *Rising Tide, 7,* 1-23.

Dweck, C.S. (2016). *Mindset: The new psychology of success.* Random House: New York.

Dweck, C. S., & Henderson, V. L. (1989). Theories of intelligence: Background and measures. Unpublished manuscript.

Engin, A. O., Calapoğlu, M., & Gürbüzoğlu, S. (2008). Uzun süreli bellek ve öğrenme [Long-term memory and learning]. *Sosyal Bilimler Enstitüsü Dergisi, 2*, 251-262.

Erişen, Y., Şahin, M., Birben, F. Y., & Yalın, H. S. (2016). Motivation levels of gifted students and their metaphorical perceptions of school. *Educational Research and Reviews*, *11*(8), 553-561. doi: 10.5897/ERR2016.2697

Ertürk, R. (2017). İlkokul öğrencilerinin "öğretmen" kavramına ilişkin metaforik algıları [Metaphoric perceptions of primary school students of the concept of "teacher"]. *E-İnternational Journal of Educational Research, 8*(3), 1-15.

Forceville, C. (2002). The identification of target and source in pictorial metaphors. *Journal of Pragmatics, 34*, 1–14.

Gardner, H. & Hatch, T. (1989). Multiple intelligences go to school: Education implications of the multiple intelligences. *Educational Researcher, 18*(8), 4-10.

Güneş, A. & Fırat, M. (2016). Açık ve uzaktan öğrenmede metafor analizi araştırmaları [Metaphor analysis studies in open and distance learning]. *Açıköğretim Uygulamaları ve Araştırmaları Dergisi, 2*(3), 115-129.

Gürel, E. & Tat, M. (2010) Çoklu zekâ kuramı: Tekli zekâ anlayışından çoklu zekâ yaklaşımına [Multiple intelligence theory: From the single intelligence approach to the multiple intelligence approach]. *Uluslararası Sosyal Araştırmalar Dergisi, 3*(11), 336-356.

Jones, D.B., Rakes, L. & Landon, K. (2013). Malawian secondary students' beliefs about intelligence. *International Journal of Psychology, 48*(5), 785-796.

Karabulut, R., Mertol, H., & Alkan, A. (2017). Üstün yetenekli/zekâlı öğrencilerin medyaya yönelik metafor algıları [Metaphor perceptions of gifted students of the media]. *Ahi Evran Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 3*(2), 187-196.

Koç, Seda Emine (2014). "Sınıf Öğretmeni Adaylarının Öğretmen ve Öğretmenlik Mesleği Kavramlarına İlişkin Metaforik Algıları" [Metaphoric Perceptions of Primary School Pre-service Teachers of the Concepts of Teacher and Teaching Profession], *İnönü Üniversitesi Eğitim Fakültesi Dergisi*, C. 15, S. 1, pp. 47-72.

Köksal, M. S. & Akkaya, G. (2017). Üstün yetenekli öğrencilerin sözel kısa süreli hafızalarının incelenmesi [An investigation of the verbal short-term memory of gifted students]. *İnönü Üniversitesi Eğitim Fakültesi Dergisi, 18*(2), 104-116.

Lovecky, D. V. (1992). Exploring social and emotional aspects of giftedness in children. Roeper Review, 15(1), 18-25.

Makel, C.M., Snyder, E.K., Thomas, C., Malone, S.P., & Putallaz, M. (2015). Gifted students' implicit beliefs about intelligence and giftedness. Gifted Child Quarterly, 59(4), 203-212. doi: 10.1177/0016986215599057

MEB (2016). *Bilim ve Sanat Merkezleri Yönergesi* [Science and Art Centers Directive], Özel Eğitim ve Rehberlik Hizmetleri Müdürlüğü, Ankara.

MEB (2013). Özel Yetenekli Bireyler Strateji ve Uygulama Planı 2013 – 2017 [Gifted Individuals Strategy and Implementation Plan 2013 - 2017], Özel Eğitim Ve Rehberlik Hizmetleri Genel Müdürlüğü, Ankara, PDF Kitap, http://orgm.meb.gov.tr/ 15 Nisan 2019.

MEB. (2018). Türkçe dersi öğretim program (İlkokul ve Ortaokul 1-8. Sınıflar) [Turkish curriculum (Primary and Secondary School Grades 1-8)]. T.C. Milli Eğitim Bakanlığı, Ankara. Retrieved from http://mufredat.meb.gov.tr/ProgramDetay.aspx?PID=332.

Mertol, H., Doğdu, M., & Yılar, B. (2013). Metaphorical perceptions of the gifted and talented students with regard to the social studies lesson. *Journal of Gifted Education Research, 1*(3), 176-183.

Miles, M. B. & Huberman, A. M. (1994). *Quantitative data analysis: An expanded Sourcebook.* (2nd ed.) Thousand Oaks, CA: Sage.

Morgan, G. (1986). Images of organization, Newbury Park, CA: Sage.

Ocak, G., & Gündüz, M. (2006). Eğitim fakültesini yeni kazanan öğretmen adaylarının öğretmenlik mesleğine giriş dersini almadan önce ve aldıktan sonra öğretmenlik mesleği hakkındaki metaforların karşılaştırılması [A comparison of metaphors about the teaching profession of pre-service teachers, who have been newly accepted to the faculty of education, before and after taking the course of introduction to the teaching profession]. *Afyon Kocatepe Üniversitesi Sosyal Bilimler Dergisi, 8*(2), 293-310.

Özsoy, Y. (2014). Bilim ve sanat merkezi öğrenci, öğretmen ve velilerinin üstün yetenekli öğrenci kavramına ilişkin metaforları [Metaphors of students, teachers, and parents attending science and art centers about the concept of gifted student]. *Üstün Yetenekliler Eğitimi ve Araştırmaları Dergisi (UYAD)*, *2*(1).

Öztürk, M., Akkan, Y., & Kaplan, A. (2014). Üstün yetenekli örgencilerin matematik kavramına yönelik algılarının incelenmesi [An investigation of gifted students' perceptions of the concept of mathematics]. *Journal for the Education of Gifted Young Scientists, 2*(2), 49-57.

Porath, M. (1997). Gifted children's understanding of intelligence. *Roeper Review, 20*(2), 95-98. doi: 10.1080/02783199709553863

Pipen, T. (2001). Metaphors and organizational identity in the Italian public services
Scandinavian Journal of Management, 16, 391-409.

Rindermann, H., Becker, D., & Coyle, R.T. (2017). Survey of expert opinion on intelligence: The Flynn effect and future of intelligence. *Personality and Individual Differences, 106,* 242-247.

Saban, A. (2008). Okula ilişkin metaforlar [Metaphors related to school]. *Kuram ve Uygulamada Eğitim Yönetimi*, 55, 459-496.

Sabatella, P.L.M. (1999). Intelligence and giftedness: changes in the structure of the brain. *Gifted Education International, 13,* 226-237.

Sak, U. (2017). Üstün zekâlılar: Özellikleri, Tanılanmaları ve Eğitimleri (7. baskı) [The gifted: Characteristics, Identification, and Training (7th edition)]. Ankara: Vize Yayıncılık.

Sak, U. (2018). *Üstün yeteneklilerin tanılanması* [Identification of gifted students]. Ankara: Vize Yayıncılık.

Satmaz, İ., Tortop, H., & Temiz, E. (2018). Investigation of the metaphorical perceptions of the gifted students related to the concept of science and art center (SAC). *Higher Education Studies, 8*(3), 34-48.

Snyder, K. E., Barger, M. M., Wormington, S. V., Schwartz-Bloom, R., & Linnenbrink-Garcia, L. (2013). Identification as gifted and implicit beliefs about intelligence: An examination of potential moderators. *Journal of Advanced Academics*, *24*(4), 242-258. doi: 10.1177/1932202X13507971

Snyderman, M., & Rothman, S. (1987). Survey of expert opinion on intelligence and aptitude testing. *American Psychologist, 42*(2), 137-144.

Sternberg, R. (1985). Beyond I.Q.: A triarchic theory of human intelligence. New York: Cambridge University Press

Stenberg, R.J. (2018). Speculations on the role of successful intelligence in solving contemporary world problems. *Journal of Intelligence, 6*(4), 1-10.

Stipek, D., & Maclver, D. (1989). Developmental change in children's assessment of intellectual competence. Child Development, 60, 521- -538.

Stipek, D., & Gralinski, J. H. (1996). Children's beliefs about intelligence and school performance. *Journal of Educational Psychology, 88*(3), 397-407.

Stump, G., Husman, J., Chung, T.W., & Done, A. (2009, October). *Students' belief about intelligence: Relationship to learning.* 39th Annual frontiers in education conference: Imagining and engineering future CSET education, FIE 2009-San Antonio, TX, United States.

vanBemmel, A. W. (2014). *Implicit theories of intelligence of gifted students in secondary education* (Master'sthesis). Available from ProQuest Dissertations and theses database. (UMI No. 3791289)

Weade, R., & Ernst, G. (1990). Pictures of life in classrooms, and the search for metaphors to frame them. *Theory into Practice, 29*(2), 133–140.

Yıldırım, A., & Şimşek, H. (2016). *Nitel Araştırma Yöntemleri* (10.bs.) [Qualitative Research Methods (10th edition)]. Ankara: Seçkin Yayıncılık.

Yılmaz, A., Esentürk, O.K., Demir, G.T., & İlhan, E.L. (2017). Metaphoric perception of gifted students about physical education course and physical education teachers. *Journal of Education and Learning, 6*(2), 220-234.

Yıldız Yılmaz, N., & Mentiş Taş, A. (2016). Başarılı zekâ kuramının kuramsal yapısı ve eğitime yansıması [The theoretical structure of successful intelligence theory and its reflection on education]. *KMÜ Sosyal ve Ekonomik Araştırmalar Dergisi, 18*(31), 98-107.

Quine, W. V. (2003). Eğretileme üzerine son düşünceler [Last thoughts on metaphor]. Kitaplık, 65, 75.

Ziegler, A., Schober, B., & Dresel, M. (2005). Primary school students' implicit theories of intelligence and maladaptive behavioral patterns. *Georgian Electronic Scientific Journal: Education Science and Psychology, 1*(6), 76-86.